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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

METZMAIER, DANIEL S

ART UNIT

PAPER NUMBER

1762

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,774	<b>Applicant(s)</b> HALIMATON, HAMDAN	
	<b>Examiner</b> Daniel S. Metzmaier	<b>Art Unit</b> 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

Claims 1-13 are pending.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment, filed 16 August 2010, sets forth the new limitation: "subjecting the hydrogel to a C<sub>1</sub> to C<sub>4</sub> alcohol vapor through a repetitive cycle of condensation and evaporation, to produce an alcogel" (Emphasis added). Basis for said limitation has not been located in the original specification and applicant fails to point out basis for the new limitation. Said limitation is deemed to be new matter.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claim 13 is rejected under 35 U.S.C. 103(a) as obvious over Tang et al, CN 1449997 A as evidenced by the corresponding English language Machine Translation obtained online @ <http://english.cnipr.com/newenpat/index.htm> and Derwent Abstract, AN 2004-063165, in view of Kistler, US 2,249,767, and White et al, US 2,807,588.

Applicant's Invention

The instant claims are directed to methods of producing silica aerogel and the aerogel produced by said method. Claim 1 is representative and generally includes:

1. (Original) A method for producing a silica aerogel, which comprises
  - (a) combustion of rice husk until the white ash is obtained,
  - (b) dissolving rice husk ash in aqueous sodium hydroxide,
  - (c) heating and stirring the resultant gel mixture to produce a sodium silicate solution,
  - (d) adding concentrated sulphuric acid to the resulting water glass solution to convert the sodium silicate to silica and produce a silica hydrogel,
  - (e) aging the hydrogel to allow the gel structure to develop,
  - (f) displacing the water with a C<sub>1</sub> to C<sub>4</sub>, alcohol, to produce an alcogel, and
  - (g) subjecting the alcogel, to super critical drying to form an aerogel.

Prior art

Tang et al (translation pages 8, 9 and 10<sup>1</sup>, examples, particularly example 1) disclose the following steps:

**Instant claim 1 step (a):** Tang et al discloses the use of “waste material rice husk dust” after burning rice husk, *i.e.*, resulting from the combustion of rice husk (see

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translation at page 5, specific embodiment). Tang et al (see translation at page 5) recognizes prior art practices of combusting rice husk at 600 °C.

**Instant claim 1 step (b):** (1) The leaching with alkaline solution. (i) Mixing rice husk dust, *i.e.*, rice husk ash from combustion, with NaOH solutions.

**Instant claim 1 step (c):** (ii) boiling and thrusting down, *e.g.*, 30 or 45 minutes.

(2) Filter and wash.

**Instant claim step (d):** (3) Acid treating. Adjusting pH to 5-9 with sulfuric acid of 1 mole/l, (acids of 0.1 to 2 N taught) thus forming a hydrogel.

**Instant claim step (e):** (4) Aging hydrogel. Hydrogel to age for 24 hours at 27 °C.

**Instant claim step (f):** (5) Replace water in hydrogel with lower alcohol. Soak hydrogel in ethanol for 40 hours.

**Instant claim step (g):** (6) Super critically dry with CO<sub>2</sub> to form aerogel. (Instant claim step (g)).

*Differences with the prior art*

Tang et al differs from the claims in an explicit disclosure or claimed characterization as heating “with stirring of the gel” in instantly claimed step (c) and the concentration of the sulfuric acid in the acid treating of instantly step (d).

*Step (c) stirring or gel characterization is not patentable difference*

Tang et al (pages 8-10 of translation including the examples) discloses the boiling and thrusting down (translation term), which would implicitly provide mixing as

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<sup>1</sup> Page numbering is actual pages numbered. Found in upper left of pages.

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required by claimed step (c) “stirring”. The materials would be in gel form resulting from digesting the ash in the alkaline solution. It is a well settled tenet in patent law that compounds or compositions and all of their properties are generally inseparable.

*Modification of the acid treating concentration*

Kistler is directed to methods of making aerogels, more specifically silica based aerogels and was patented in 1941. Kistler (page 1, left column, lines 43 et seq; and column 2, lines 29 et seq) teaches typical processes for making aerogels comprising: forming a hydrogel in a liquid medium, e.g., water, simply by acidifying water glass with sulfuric acid by well known manners of manufacturing silica gel of commerce. Forming an alcogel by replacing the water with alcohol by soaking in alcohol and subjecting the alcogel, to drying in an autoclave to form an aerogel. The step of forming a hydrogel from sodium silicate by treatment with sulfuric acid is well established in the art.

White et al (column 12) cites the Kistler '767 patent as prior art as well as others. White et al discloses making hydrogels and aerogels (title and abstract). White et al (examples) teaches making hydrogels and aerogels by acidifying sodium silicate (*i.e.*, water glass) with concentrated 97 % sulfuric acid followed by formation of the aerogels. White et al (further teaches the sodium silicates have a ratio of  $\text{Na}_2\text{O} : \text{SiO}_2$  of 1 : 3.2 and 1 : 3.33 (examples I or IV and III, respectively), which “about 1 : 3.33” of claim reads.

These references are combinable because they teach methods of making silica aerogels. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ sufficient sodium hydroxide to provide a sodium silicate

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Na<sub>2</sub>O : SiO<sub>2</sub> ratio of “about 1 : 3.33” and treating said sodium silicate with concentrated (e.g., 97 %) sulfuric acid to form the hydrogels of the Tang et al aerogel making processes as obvious art recognized parameters in the art of silica aerogel making processes.

The remaining claim limitations are explicitly disclosed in the prior art cited here and/or obvious variations therefrom. Tang et al (pages 5 and 6) teach purifying by leaching with sulfuric acid to improve the purity is known. Furthermore, merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality for a result-effective variable, *i.e.*, a variable which achieves a recognized result.

### ***Response to Arguments***

5. Applicant's arguments filed 16 August 2010 have been fully considered but they are not persuasive.

6. Applicant (pages 6 to 10) assert the Tang process lacks a teaching of the “repetitive cycle of condensation and evaporation”. Applicant characterizes the “repetitive cycle of condensation and evaporation” as the soxhlet extraction disclosed. The rejection over Tang et al, CN 1449997 A as evidenced by the corresponding English language Machine Translation obtained online @ <http://english.cnipr.com/newenpat/index.htm> and Derwent Abstract, AN 2004-063165, in view of Kistler, US 2,249,767, and White et al, US 2,807,588, has been withdrawn for claims 1-12, directed to the methods, in view of applicant's amendment.

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7. Applicant further characterizes the extraction as improving the rate of solvent exchange. Said change in exchange rate has not been shown to impart patentable distinction to the aerogels produced.

8. Similarly, the new limitation "supercritical drying with additional alcohol" has not been shown to impart patentable distinction to the aerogels produced. Said limitation has been given little or no patentable weight for the following reasons.

9. Applicant further asserts "supercritical drying with additional alcohol" is not disclosed in Tang and that supercritical drying with CO<sub>2</sub> in Tang is merely an optional step in the instant process. Applicant's claims do not exclude the supercritical drying with CO<sub>2</sub> in Tang. The additional alcohol has not been quantified in the claim. Since Tang is supercritical drying an "alcogel" with CO<sub>2</sub>, the alcogel would necessarily contain additional alcohol for maintaining the alcogel up to the point of drying.

10. Applicant's remaining arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not



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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David W. Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/Daniel S. Metzmaier/  
Primary Examiner, Art Unit 1762**

DSM